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Proceedings

In commemoration of the

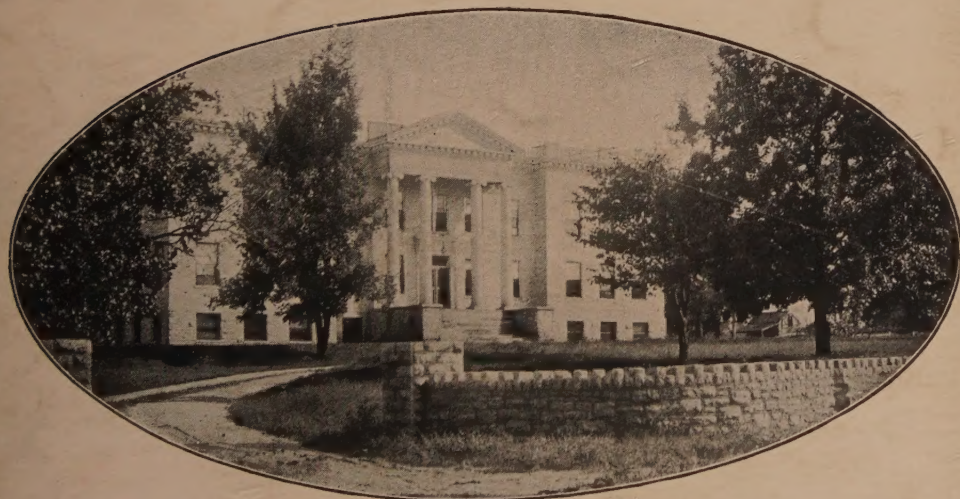


Fiftieth Anniversary

of the

*Kentucky Agricultural
Experiment Station*

Wednesday, Sept. 25, 1935



PROCEEDINGS

IN COMMEMORATION OF THE

Fiftieth Anniversary

OF THE

KENTUCKY AGRICULTURAL
EXPERIMENT STATION

Wednesday, September 25, 1935



LEXINGTON, KENTUCKY

BULLETIN NO. 388

NOVEMBER, 1938



THOMAS POE COOPER, Sc. D.

Director of the Kentucky Agricultural Experiment Station and Dean of the
College of Agriculture, 1918—

FIFTIETH ANNIVERSARY
OF
KENTUCKY AGRICULTURAL EXPERIMENT STATION
September 25, 1935

The Kentucky Agricultural Experiment Station was established in 1885. It has for its object and mission to seek, to discern and to serve in all matters affecting the agricultural development of the State and Nation. It stands for the dissemination of knowledge to every farm home in Kentucky, to the end that agriculture may be the best as well as the greatest industry in the State. The results of its research and experimentation have been a distinctive contribution to the progress and welfare of the Commonwealth and of service nationally and internationally.

THOMAS P. COOPER,
Director.

Anniversary Committee

J. D. TURNER, *Chairman*
T. R. BRYANT
H. E. CURTIS
E. S. GOOD
A. M. PETER
GEORGE ROBERTS

PROGRAM

Wednesday, September 25, 1935

10:00 to 12:00 A. M.

Visits to Experiment Station buildings and Experiment Station farm. (Members of the staff will accompany visitors.

Recess

MEMORIAL HALL

2:00 P. M.

PRESIDENT FRANK L. McVEY, *Presiding*

INVOCATION, Rev. T. C. Ecton

HALF A CENTURY IN RETROSPECT, Dean Thomas P. Cooper

AS THE FARMER VIEWS THE EXPERIMENT STATION,

Senator Perry B. Gaines

MELVILLE AMASA SCOVELL—FOUNDER AND BUILDER,

Professor George Roberts

JOSEPH HOEING KASTLE, DIRECTOR 1912-1916,

Dr. G. Davis Buckner

AGRICULTURE AND SCIENCE, Dr. F. B. Mumford, Dean and
Director, College of Agriculture, University of Missouri

MUSIC

ANNOUNCEMENTS

BENEDICTION

After the invocation by Reverend T. C. Ecton, President Frank L. McVey, presiding, made appropriate introductory remarks and then introduced the speakers who presented papers as follows:—

A HALF CENTURY IN RETROSPECT

By THOMAS POE COOPER

A half century in retrospect. So stated, it sounds like a long, long time. However, the problems of existence are merely milestones in progress and a half century is not limited in terms of time but rather by accomplishments. The facts obtained by the Kentucky Agricultural Experiment Station thru its investigations, researches and regulatory work, with their far-reaching applications, form an array so imposing as to be of challenging interest. We pause to review briefly the work of the institution upon this its fiftieth anniversary.

The Experiment Station owes its existence to a resolution passed by the Executive Committee of the Board of Trustees of the Agricultural and Mechanical College of Kentucky on September 25, 1885. The establishment of the institution was without particular public acclaim or comment. Indeed, there was slight recognition of the importance or of the great implications which existed in the establishment of the institution whose primary duty was to carry on researches and investigations for the advancement of agriculture. Few recognized the significance of this event which occurred approximately a year and a half in advance of the passage of the Hatch Act, the purpose of which is "to aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and applications of agricultural science."

The progress of the Kentucky Experiment Station may chronologically be divided into three periods. The first period, from establishment until about 1906, marked the struggle for existence, the attempt to chart a course of action and to win the confidence of the public. The second period began about 1906, following the passage of the feed control act, the new food and drugs act, the Adams Act, and extended to the close of the World War. These acts provided means for development and a greater expansion of the services of the Experiment Station. Further opportunity was given by the annual appropriation made by the state legislature. This was a period which

demanding greatly increased service from the Experiment Station and it focused public interest in the application of its findings to agriculture. The third period, the present one, which dates from the close of the World War, is marked by services more far-reaching than those demanded in former times. Funds provided by Congress for research permit an intensification and broadening of the basic field of scientific research and for the inclusion of the economic and social sciences as applied to basic research in agriculture.

In the selection of Dr. Melville Amasa Scovell to the directorship of the newly created institution, there were implanted, as it were, the constructive efforts, ideals and standards which have characterized the work of the Experiment Station. Dr. Scovell assumed his duties in November, 1885. One room in the basement of the present Administration building of the University was his office, chemical laboratory and general work-room.

In the winter of 1886, the legislature designated the station as the Kentucky Agricultural Experiment Station and passed an act controlling the sale of commercial fertilizers in the state, and empowered the director of the station to make all official analyses under the law and authorized him to make all necessary rules and regulations for its proper enforcement.

In the spring of '86, such tillable land as the College had was assigned to the station for field experiments. The field assigned contained about twelve acres, most of which was found to be unfit for this purpose on account of the very marked unevenness of fertility of the soil, caused by having the surface soil taken off here and there over various portions of the field for making brick for building the college.

In the same year, an Assistant Chemist was appointed. Before this, the Director was alone in the work of the station, except that by a resolution of the Executive Committee, the professors of chemistry, agriculture and botany, were to assist in the work of the station insofar as such work did not interfere with their proper college duties. After Congress passed the Hatch Act in 1887, the authorities at once took steps to put the station on a firmer basis.

Action was taken looking to the purchase of a farm for experimental purposes, for the erection of a station building for offices, laboratories, etc., and for increasing the working force of the station, but by a decision of the Comptroller of the Treasury, the funds due under the operation of the Hatch Act did not become available until the following year, and no great increase of the working force could at once be made. In June, another Assistant Chemist was employed. In the fall, a farm of 48½ acres was purchased and in May, 1888, the contract was let for the station building (which is now the law building). In June, 1888, steps were taken for the employment of an agriculturist and an assistant agriculturist, and for procuring the necessary books, apparatus, etc., which would be required as soon as the new quarters were ready.

The records show that in 1889, the officers of the institution included the director, a chemist, two assistant chemists, an agriculturist, farm superintendent, practical horticulturist, a secretary and stenographer. The early work of the station was confined almost entirely to chemical analyses, investigations and field experiments.

Three years after its organization, the Experiment Station had made studies sufficiently advanced to publish 16 bulletins covering such subjects as the effect of fertilizers on the quality of tobacco, corn fodder as a food for stock and other publications on the various aspects of fertilizers.

As early as 1892, the Experiment Station issued a bulletin which set forth the tests on marl, and the importance of lime in restoring fertility to worn lands. These tests thus set up the work in soils which has been continuous since that time.

It may be of interest to recall the small beginning of one branch of practical work on which the Experiment Station has prided itself for 43 years—that is the herd of Jersey cows and the production of pure milk of low bacterial count on a commercial scale and with no unusual equipment. This herd was established in February, 1892. The minutes of the Board of Trustees state that “The two cows now at the station and in the butter experiment are purchased from Professor Scovell at \$150 each” and \$816 balance on hand of experiment fund was appropriated to the establishment of a dairy.

The findings of the Station were in demand. In his early reports, Dr. Scovell indicated how the larger part of his time was taken up in answering the questions of farmers and that the requests for bulletins were such that supplies were exhausted soon after printing.

During the early 90s, it was necessary to consider methods which would provide more income. It was decided to develop certain much needed services for the farmers of the state. In the administration of acts regulatory in nature, yet primarily educational in value, it seemed proper that some portion of the fees obtained therefrom should be expended for research. This was a sound viewpoint for in the following years, the public became conscious of its need for direction in the purchase and use of products offered for human and animal consumption. As the Experiment Station developed these services, public confidence grew in the work of the institution. That its dominating purposes were to assist both the farmer and producer, to enable the rural people to come to a source from which much needed information could be obtained, and that its findings were unbiased and could not be bought became an established fact.

The second period of development began substantially in 1906. The present feedstuffs law went into effect; a new food and drug law was passed; the seed law was amended and its enforcement placed in the hands of the Director of the Experiment Station, Congress passed the bill known as the Adams Act which provided additional appropriation for research work. The passage of the national pure food law and the meat inspection law made possible cooperative work in these lines with the Government. Thus wider fields of work were entered into and the enlargement of the staff was made possible.

The twenty years which had passed had convinced many thinking, forward-looking farmers of the value of the Experiment Station and of the many ways by which agriculture could profit thru its services. There was a feeling that the state should appropriate funds for its work. This culminated in an annual appropriation of \$50,000 in 1912 and gave tremendous impetus to the work of the institution. Farmers, more than ever, were interested in its findings and ready to apply the

practices which it advocated; and for the first time funds were available for the needed progress.

Perhaps the most important development under the new appropriation was the establishment of ten soil experiment fields in different parts of the state. These fields brought direct to every section of the state the work of the Experiment Station in the maintenance of soil fertility and established the basis of a better knowledge in the treatment of the varying soils of the state. Incidentally, these fields are the basis of the great soil improvement programs carried on thru the Extension Division.

The Experiment Station farm now comprised 240 acres. In 1903, the first wing of the present station building was begun and in 1905 completed; in 1913, the second wing was completed. The Experiment Station entered upon its second period of development reasonably well provided with buildings, land and equipment. The scientific staff had increased and in 1911, Dr. Joseph H. Kastle returned as head of the newly organized division of chemical research. His true conception of research gave to the institution that substantial and sound background that has contributed so much to fundamental research. His fine, eager spirit and the keen imagination which characterized his chemical and biological researches are still apparent in our laboratories.

During the third period of development, which began about 1918, increased funds made possible additional work. There was encouragement in the widening public interest and support. Additional services were assigned to the Experiment Station and its scientific work was given further impetus by the passage of the Purnell Act in 1925, with its appropriation, doubling within a few years the money heretofore made available by Congress for scientific work. Purchases of land increased the Station farm to approximately 600 acres; two substations were established, namely, the Robinson Substation in Breathitt County, with some 15,000 acres of land, which has for its chief interests the mountain problems in agriculture and forestry; and the Western Kentucky Substation at Princeton, with 600 acres of land, where the special farm problems of western Kentucky are given particular study. The physical plant of the Experiment Station at Lexington was expanded by

the erection of the livestock pavilion, the dairy products building, the agricultural engineering building, the small animal house, beef cattle, hog and sheep barns and poultry plant. The staff has increased until now its scientific workers and clerical staff number 100.

OUTSTANDING ACHIEVEMENTS

Kentucky may take a pardonable pride in the achievements of the Agricultural Experiment Station. Much of its work is original. It has established agricultural principles of great value not only for Kentucky, but nationally and internationally. Interesting as these accomplishments are, time will permit merely the mention of those of marked importance.

A service which effects an annual saving of thousands of dollars to the state as well as to the Nation was the discovery and isolation of the germ causing infectious abortion in mares. The disease made its appearance in 1893 and became so widely distributed that it threatened the horse industry. In 1911, research workers at this institution isolated the germ and four years later perfected a vaccine, now widely used, which immunizes mares against the disease.

Discoveries of the causes of sterility in brood mares and of the diseases of new-born foals, and the advocacy of breeding hygiene in the prevention of these troubles made the Experiment Station invaluable to the horse industry of the state and brought it international fame.

The results of investigations as to the cause of forage poisoning in horses, cattle and mules (known in humans as botulinus) have meant much economically to the livestock producers of the whole country. After an extended study, an anaerobic germ was isolated from the digestive tracts of horses dead from the disease, which when grown in pure culture and injected into other animals produced the disease. The same germ was also isolated from feeds causing forage poisoning and further studies resulted in the production of a preventive serum.

Of importance is the classification of a type A animal strain of hemolytic streptococci, the organisms of the para-

typhoid group, particularly aertrycke. Other research work in animal nutrition and diseases determined the trouble in sheep commonly called pregnancy disease or acidosis and found the preventive to be a balanced ration.

Scientists at the Kentucky Experiment Station were among the first to establish the fact that milk fever in cows is a biochemical problem due to physiological unbalance.

Studies of the cause of clover bloat, pellagra, the effect of lysine content of feeds in the growth of chicks, the cause of rancidity in corn meal, are but a few of the important investigations which resulted in new and valuable information to the world.

Intensive studies of tobacco diseases have been conducted with the object of finding simple, easily applied preventive measures for the common diseases of Kentucky's chief cash crop. The principal sources of infection with mosaic disease, commonly known as walloon or blue or black french, have been discovered. This disease was regarded as a serious menace to the tobacco industry for more than fifty years. Workers at the Kentucky Experiment Station first found that the principal source of infection was natural leaf tobacco chewed or smoked by workers while weeding and pulling tobacco plants. This method of controlling mosaic has been tested in many parts of the world and is gradually becoming a standard practice in tobacco-producing areas. Not only is the information of value to tobacco growers, but it is of equal importance to tomato growers, who find that frequently mosaic enters greenhouse tomatoes from tobacco used by the employees.

Other virus diseases of tobacco have been studied with results of scientific importance. The common mosaic disease of potatoes was found to be caused by a mixture of two viruses, one of which is readily transmitted to tobacco grown in the vicinity of potatoes. Cucumber mosaic and certain other virus diseases of tobacco were found to be transmissible to potatoes. Thus a further relation between the virus diseases of these two important crops was established.

In continuous progress are studies of the life history of various insects and fungi injurious to plants, and the develop-

ment of means of checking their injury by spraying or otherwise to prevent enormous losses which they occasion.

In 1930, as a result of hybridizing resistant varieties of dark tobacco with Burley, Kentucky White Burley No. 5, a highly root-rot resistant strain of tobacco was introduced. More than three-fourths of the tobacco grown in many counties is of this variety. Extensive breeding experiments have been under way for some time to develop varieties of dark tobacco resistant to root rot. Resistant strains of the Green River type have been tested by farmers and have proved satisfactory. Dark-fired resistant varieties are soon to be introduced.

Another important contribution is the solution of the problem of red clover failure which became serious on Kentucky farms about 1930.

The Experiment Station has developed varieties of wheat, Ashland and Kentucky, much superior to those previously grown in the state; new varieties of oats and barley especially adapted to Kentucky. It was among the first to test Korean and Kobe lespedeza and to recognize their possible value.

Previous to 1912, it was thought that only ten of the ninety or more chemical elements then known were essential in the economy of both plants and animals. It was well known among agricultural chemists that as many as twenty-five or thirty additional chemical elements could be detected in small quantities in the tissues and organs of both plants and animals which received their sustenance from fertile soils in a normal way. A study to ascertain the necessity and function of a number of the minor chemical elements in the economy of plants and animals was begun in 1912. This was the first attempt on the part of an experiment station to obtain conclusive evidence that more than ten of the chemical elements are necessary factors, in the economy of both plants and animals. Several years of extensive researches in nutritional problems of both plants and animals at the Kentucky Experiment Station show that a number of the minor chemical elements, including manganese, copper, zinc, boron and iodine are factors of fundamental importance for the normal growth and metabolism of both plants and animals. Formerly, it was assumed that the soils contained an adequate supply of minor chemical elements and that the important food crops

grown on any soil would be able to extract from it all the minor elements necessary not only for crop growth but also for the growth and proper functioning of animals when the plant products were consumed as food. It is shown that this assumption is erroneous in many instances and that some soils are not only deficient in the major elements, nitrogen, phosphorus, calcium, magnesium and potassium but also are deficient as well in the minor elements, manganese, copper, zinc, boron and iodine; consequently they produce no crop at all, or poor quality of important foods, inadequately supplied with the mineral nutrients necessary for the normal metabolism of domestic animals and man.

The establishment of the various soil fields and much laboratory work on soils have furnished a basis for a comprehensive soil improvement and conservation program, applicable to the various soil areas of the state. It has been shown that practically all soils of the state may be brought to a high state of productivity by the simple process of applying lime and phosphate and the proper use of legumes—a condition that puts Kentucky in a highly favorable position because of her abundant supply of cheap liming materials, proximity to the phosphate fields and favorable climate for grasses and legumes.

Numerous trials and investigations have been made in the field of animal feeding and much of the information obtained is being utilized by the farmer and feeder.

Research in economics and rural life has been stressed and the results obtained from these studies bear no small part in the betterment of life within the state.

Representative herds of purebred beef cattle, dairy cattle and hogs, as well as flocks of purebred sheep and poultry are maintained by the Experiment Station at Lexington and at its substations.

Briefly, these are a few of the many accomplishments of the Kentucky Agricultural Experiment Station within the past half century and a short portrayal of the development of the institution. The establishment of the Experiment Station was due to the foresight of men who were confronted with agricultural problems of their day. Since that time the progress of the Experiment Station is marked by the exigencies of our

times. As conditions become more complex, the demands on the Experiment Station become more urgent. The problem of adequately financing agricultural projects has often been puzzling, but the gratitude and appreciation of the people of the state and the recognition nationally and internationally is indeed heartening.

The history of an institution depends intimately upon its staff. From the beginning the Kentucky Agricultural Experiment Station has been successful in procuring men and women imbued with ideals of research and service. They have performed their work well and many have attained national and international reputation. We are fortunate to have with us today, three members whose service almost parallels the existence of the institution—Dr. Alfred M. Peter, Mr. Henry E. Curtis and Dr. Harrison Garman.

Thruout the half century the Experiment Station has had the confidence and support of the leading farmers, the cooperation and good will of business organizations, the efforts of the legislature to provide funds to meet its necessities. It constantly strives to seek, to discern and to serve in all matters affecting the agricultural development of the State and Nation. It stands for the dissemination of knowledge to every farm home in Kentucky to the end that agriculture may be the best as well as the greatest industry in the State. The results of the research and experimentation of the Kentucky Agricultural Experiment Station have been a distinctive contribution to the progress and welfare of the Commonwealth and of service nationally and internationally.

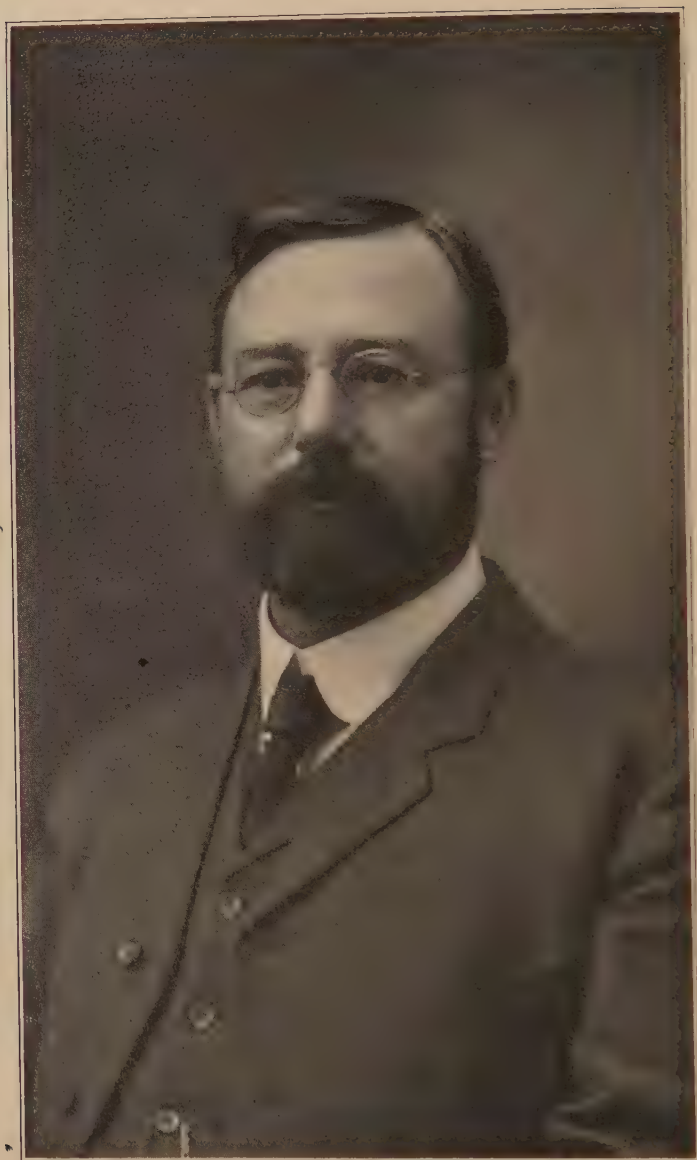
MELVILLE AMASA SCOVELL, FOUNDER AND
BUILDER

By GEORGE ROBERTS

Melville Amasa Scovell, the first Director of the Kentucky Agricultural Experiment Station, was born at Belvidere, New Jersey, February 26, 1855, and died at Lexington, Kentucky, August 15, 1912, in his fifty-eighth year and the twenty-seventh of his directorship. Shortly after his birth his family moved to Chicago, and from there to a farm in Champaign County, Illinois, the county in which the University of Illinois is located. He graduated from high school at the age of fifteen, and entered the University of Illinois at the age of sixteen. He specialized in chemistry, graduating at the age of twenty, and two years later earned the Master of Science degree. In his sophomore year at the University he was appointed assistant in chemistry, and after graduation he was appointed instructor in chemistry, serving in this position for one year. He had charge of a chemical exhibit at the Centennial Exposition at Philadelphia in 1876. He served as private secretary to the Regent of the University from 1876 to 1879. He was appointed Instructor in Agricultural Chemistry in 1878, Assistant Professor in 1879, and Professor in 1880, at the age of twenty-five, being the first to hold this professorship at the University of Illinois. His rapid promotion in his professional field, with attendant responsibilities, was the fulfillment of his youthful promise of ability.

While serving on the staff of the University of Illinois, Professor Scovell became interested in the manufacture of glucose and of sirup and sugar from sorghum and other sugar-producing plants, and in association with Dr. H. A. Weber patented a number of processes for clarifying juice from sugar-producing plants and for the manufacture of products from sorghum. In 1883-84 he was superintendent of the Kansas Sugar Works, a commercial plant at Sterling, Kansas. In 1884-85 he was special agent for the United States Department of Agriculture, having charge of certain phases of sugar production from sorghum and sugar cane in Kansas and Louisiana.

In May, 1885, the United States Commissioner of Agriculture, Mr. Norman J. Coleman, issued a call to the various agri-



MELVILLE AMASA SCOVELL, Ph D.

Director of the Kentucky Agricultural Experiment Station,
1885-1912.

cultural colleges and other industrial and educational institutions, inviting them to send representatives to meet in convention in Washington. President Patterson of the A. & M. College of Kentucky attended this meeting and said concerning its deliberations:

"The subject which came in for the largest share of discussion, the one in which I was most interested, was that of the establishment of experiment stations. Some such stations were then operative in a number of states and were rendering great service to the farmers. I saw a distinct opportunity in the intelligent work of an experiment station in Kentucky, and immediately upon my return made plans looking toward its establishment. I was persuaded that not only would the State be benefited by an experiment station, but that the relations of the College to the farmer would be greatly improved thereby."

This last sentence of President Patterson's statement has been amply justified by fifty years of subsequent history; but had not a man of tact, ability, and singleness of purpose to render the best service possible to the farmers of the State been chosen as first Director of the Experiment Station, the story might have been very different. In my opinion the attitude of open hostility toward the A. & M. College that existed on the part of many people of the State, and of indifference on the part of many others, were turned into one of appreciation and friendliness more by the service of the Experiment Station than by any other influence.

The Agricultural and Mechanical College of Kentucky was founded in 1865. Twenty years had passed without very much substantial instruction in agriculture, for there was not a body of scientific knowledge sufficient for such instruction, here or elsewhere. It was not until experiment stations, thru their research, developed reliable scientific information that could be used for instruction that agricultural colleges began to attract large numbers of students. This development brought the land-grant institutions into prominence, strengthened other departments and gained support for them as much as for the agricultural departments themselves.

In the autumn after the meeting in Washington, President Patterson visited the Universities of Wisconsin, Michigan, and Illinois, observing their work and seeking a director for the Station in Kentucky. Shortly after his return the Executive Committee of the Board of Trustees met, on September 25, 1885, and

passed a resolution establishing the Agricultural Experiment Station. At this meeting, upon the President's recommendation, Prof. M. A. Scovell was elected to the directorship of the Station at a salary of fifteen hundred dollars per year. The services of Dr. Robert Peter and Prof. A. E. Menke, chemists, and Prof. A. R. Crandall, geologist and botanist, members of the teaching staff of the College, were placed at the disposal of the new Director. Thus the founding of the Experiment Station antedated the passage (in March, 1887) of the Hatch Act extending Federal aid to experiment stations.

Professor Scovell arrived in Lexington on Thanksgiving Day, 1885, to begin his duties as Director. A single room in the basement of the present Administration Building (then called the College Building) was fitted up as office and laboratory. (Here is a hint to some young men who think they cannot do anything without a lot of fine equipment to start with.) His was an example of that faith and courage that remove mountains. Before him was a task to challenge his imagination and all his resources. The immediate success or failure of the station was his success or failure. He it was who would have to determine policies, select personnel, meet farmers and convince them that scientific investigation held possibilities for improving their lot—in short, to create a friendly attitude toward the new institution. He knew that the future lay only in one course, that of immediate service to agriculture that could readily be utilized and appreciated by the average farmer of the State. I say that he knew this, because it was the guiding motive of his work in the beginning, and those of us who were intimately associated with him know that it was his guiding motive to the end of his career. He did not, could not, from his very nature, sacrifice ideals of public service for immediate advantage thru political maneuvering, which he despised and which always is dearly paid for sooner or later. While he had the highest regard for and encouraged what some call pure research—that is, research that does not have as its direct object the solution of some immediate problem of economic importance—he made the solution of farmers' problems his first concern.

The Legislature of 1886, thru the initiative of Professor Scovell, passed an act regulating the sale of commercial ferti-

lizers, which placed the administration of the law in the Director of the Experiment Station. In this act the Legislature, in specific language, designated the newly organized experiment station as the "Kentucky Agricultural Experiment Station." This act required that each bag or other package of fertilizer offered for sale carry a label bearing a statement of the analysis certified by the manufacturer to the Director of the Experiment Station. There was at the time of the passage of this act a law regulating the sale of fertilizers, but it was not effective. It was Professor Scovell's alertness to the welfare of the farmer, as illustrated in his immediate sponsoring of this law, that first won for him and the Experiment Station the confidence of the farming public that never abated thruout the twenty-seven years of his directorship, the longest then on record.

Very soon after entering upon his duties, Doctor Scovell made plans for experimental work on soils and crops. Such tillable land as there was on the campus of 52 acres was assigned to him. In 1886 he made tests of varieties of potatoes, of methods of seed-bed preparation, and of the effect of fertilizers on yield. He made a similar test on wheat seeded that year. Another test of interest and significance that he and his associates made at the time (1887) was a study of the composition of nitrogen-fertilized bluegrass and unfertilized bluegrass, both cut at different stages of growth. He found a range in protein content from nearly 18 percent for fertilized bluegrass cut May 13, down to 9 percent for unfertilized grass cut June 9. He found similar differences in other grasses. In this is a lesson that is yet to be learned by a large majority of our farmers, namely, that by making soil fertile, not only may larger yields be more economically produced, but the nutritive value of pasture and other crops may be greatly increased; and, by inference, that pastures are more nutritious if grazed at the proper stage of growth than if allowed to become too carbonaceous.

Doctor Scovell saw the great need of immediately obtaining land for experimental purposes, and in October, 1887, purchased the first unit of the present Experiment Station farm, a tract of 48 acres, on which is located the Director's residence. By 1891 he had many field experiments under way on the newly acquired farm. They included variety tests of various crops, methods of

seeding and cultivation, and fertilizer tests. He made additions to the farm until at his death it consisted of 240 acres. He had visions of more additions and used to wave his hand to the south and say, "We will own that land some day." Dean Cooper, with his usual foresight and good judgment, has, upon his own initiative, made Doctor Scovell's dream a reality: the central farm now contains approximately 600 acres.

While on the subject of land, it should be stated that Doctor Scovell at once recognized that results of soil experiments conducted on the farm at Lexington must necessarily have limited application to other soils of the State, because of the wide difference in the nature of the soils. Unable to purchase land elsewhere for experimental purposes, he conducted cooperative fertilizer tests with farmers in different parts of the State. In 1890 Doctor Scovell had in various parts of the State, from Taylor County to Fulton County, more than a dozen such cooperative experiments. Not only was he recognizing the diverse nature of the soils of the State, but he was making the acquaintance of farmers and stimulating their interest in the new institution.

Doctor Scovell, of course, knew that cooperative experiments could never be conducted with the accuracy and for the length of time necessary for reliable conclusions. Nor was there money for purchasing land in various parts of the State. This situation came to a head in 1912 when a proposal was made by an interested member of the Legislature to introduce a bill to establish a sub-experiment station in western Kentucky. Professor Scovell was at the same time interested in obtaining an appropriation for generally strengthening the work of the Experiment Station. Because of his earnestness, sincerity, and his reputation for seeking only what was for the best interests of the State, he was able to get passed a combination bill appropriating \$50,000 annually for various lines of research, among which was a provision for the establishment of soil experiment fields in various parts of the State, instead of an appropriation for a substation which could serve only one region. Doctor Scovell was not opposed to substations, but knew that with the amount of money the Legislature was likely to appropriate much more good could be accomplished by a number of small experiment fields than by a substation. Under that provision, nine experiment

fields have been established in different parts of the State. Because of the interest in soil improvement that had been developed by the Experiment Station, and because of the confidence of farmers in the Experiment Station, that had been developed by Doctor Scovell, the Experiment Station did not have to buy land for any of the experiment fields, it being provided by local people, usually by the county fiscal court.

The work on these experiment fields raised many questions which could not be answered on their limited area, and made logical the establishment of substations, which were soon developed under Dean Cooper's administration.

I have used the phase of work with which I am most familiar to illustrate the vision and constructive genius of Doctor Scovell in accomplishing results. But Doctor Scovell undertook to develop all the important phases of agricultural research.

The erection of an Experiment Station Building (now the Law Building) was begun in 1888 and finished early in 1889. The staff of 1889 consisted of the Director; A. M. Peter and H. E. Curtis, assistant chemists; Harrison Garman, entomologist and botanist; and an assistant each in horticulture and agriculture. In 1892 a department of horticulture was organized, with C. W. Mathews as its head. Mr. Curtis is yet in active service, with forty-eight years to his credit, perhaps the longest record of experiment station service in the country. Doctor Peter and Doctor Garman are both quite active on the emeritus list.

As early as 1889 experiments were begun in animal feeding, tests being made with pigs, and the next year with sheep. But Doctor Scovell was best known in the field of animal production for his work with dairy cattle. He was recognized as one of the outstanding dairy experts in this country, particularly as a judge of dairy cattle. The *Breeders Gazette* spoke of him as the best known and best liked judge of dairy cattle in America. He judged dairy cattle frequently at state fairs in Indiana, Ohio, Illinois, Tennessee and Texas, and at the Pan-American Exposition at Buffalo, the National Dairy Show, and the Canadian National Dairy Show at Toronto. He early began the development of a Jersey dairy herd at the Kentucky Experiment Station which has continued to the present as an outstanding herd,

thru additions and improvement by breeding. There are descendants in the herd today of Dolly's Valentine, added to the herd in 1898. She held the world's record for butterfat production from 1899 to 1905. As an indication of the kind of dairy that had been built up under the guidance of Doctor Scovell, we cite the fact that in 1915 milk from it shipped to the San Francisco Exposition won second prize, with a bacterial count of 300 on arrival; the first prize went to California milk. In February, 1893, Doctor Scovell was appointed chairman of a committee to conduct a series of dairy tests at the World's Columbian Exposition. This committee was composed of such men as Babcock, of Wisconsin, of butterfat test fame; Armsby, of Pennsylvania, expert in animal nutrition investigations; and representatives of various dairy cattle organizations. The committee met daily for ninety days, during which the tests were in progress. The data obtained covered nine hundred pages, a resume of which was published by Doctor Scovell in the *Jersey Bulletin*. In connection with this work, Doctor Scovell invented a milk sampling tube which was described as a useful instrument which would take an accurate small sample of milk from a cylindrical bucket. The Experiment Station dairy has been a powerful influence in establishing pure milk supplies for Kentucky towns and cities.

Doctor Scovell was trained as a chemist and always retained his interest in this field. As Director of the Station, he was a member of the Association of Official Agricultural Chemists, and served on important committees, both executive and technical, and was president in 1889-90. He was active in promoting the enactment of pure food and drug legislation, having served on the Committee on Pure Food Standards with Wiley, Jenkins, Weber and Frear, names of national prominence in those days.

In addition to all this work on committees, Doctor Scovell found time to do research work. He worked out a modification of the Kjeldahl method of determining nitrogen to include nitrates, a piece of work which attracted universal attention and was adopted as an official method by the Association of Official Agricultural Chemists. The degree of Doctor of Phil-

osophy was conferred upon him in 1908 by the University of Illinois, this piece of work being his thesis.

Doctor Scovell was active in the Association of Agricultural Colleges and Experiment Stations, having served as secretary-treasurer in 1891, later as vice president, and finally as president in 1909, a testimony to his prominence as a national agricultural leader. He was for eleven years a member of its Executive Committee, a tribute to his executive ability and to the esteem in which he was held.

It is no wonder that as a young man with a growing record of accomplishments, other institutions sought his services. He was offered the directorship of the Illinois Agricultural Experiment Station in 1894, but declined.

In 1908 the Legislature gave the A. & M. College the status of State University, with the usual university organization consisting of colleges. In 1910 Doctor Scovell was made Dean of the College of Agriculture, retaining the directorship of the Experiment Station. He was thus able at once to reorganize the College, coordinating all the various teaching, research and extension activities, to which had been recently added a department of home economics. Within the two remaining years of his life the extension work of the College, with T. R. Bryant in charge, had so developed that it was having a great influence in many localities in the State. We are accustomed to think of extension work as a development under the Federal Smith-Lever Act of 1914, but the work in Kentucky was well under way before that law was enacted.

At the time of the death of Doctor Scovell an addition to the Experiment Station Building was under construction and the staff numbered between fifty and sixty, practically every phase of agricultural investigation being represented.

I think safely it may be said that Doctor Scovell overtaxed his physical strength in service to a cause and to a people, both dearer to him than his own personal interests.

An estimate of Doctor Scovell's career would not be complete without a tribute to his devoted wife, Mrs. Nancy Davis Scovell, who was always keenly interested in all the affairs of the Institution and who, by her gracious personality, helped to

form that strong bond of friendship that so characterized his relationship with the local community and the State.

Doctor Scovell was more than scientist and executive. He had time to be interested in all things that made for a better community—large or small. He was neighborly and took time to show it. He had a saving sense of humor, without which it is difficult to be a great executive. The resolutions of the staff upon his death recited his merits as a director and then stated: "but more than all these (he was) the gentle, kindly, sympathetic friend." The resolutions of the American Association of Agricultural Colleges and Experiment Stations contain these statements: "He was a public spirited citizen, mindful of the obligations of good citizenship, and a helper in the affairs of neighborhood and state." . . . "The members of this association desire to express their grateful recollection of a life spent in earnest public services and of a friend courteous, loyal, broad in sympathy and unspotted from the world." Dr. Joseph H. Kastle, an associate thruout most of his career in Kentucky, said that in all this time he did not recall seeing him angry nor remember to have heard a single harsh or unkind word fall from his lips, nor an unkindly criticism of his fellow man. He quoted as applicable to him the proverb "He that is slow to anger is better than the mighty; and he that ruleth his spirit than he that taketh a city." Upon his death, many letters and telegrams of condolence and sympathy came from all parts of the United States and from Canada, attesting the high esteem in which he was held. At the hour of his funeral traffic in Lexington was stopped for a brief period, an impressive token of the high respect in which he was held by the people of this city.

Fortunate indeed was Kentucky in having such a man as the first director of the Experiment Station to lay the foundation for so important an institution as the Agricultural College has become with its manifold activities in research, teaching, and extension work.

Very appropriately we may apply to Doctor Scovell the following from Ruskin's "The Lamp of Memory": "When we build, let us think we build forever. * * * Let it not be

for present delight, nor for present use alone; let it be such work as our descendants will thank us for; and let us think, as we lay stone on stone, that a time is to come * * * when men will say as they look upon the labor and wrought substance of them, 'See this our fathers did for us.' "



JOSEPH HOEING KASTLE, Ph. D.

Director of the Kentucky Agricultural Experiment Station, 1912-1916.

JOSEPH HOEING KASTLE, Director, 1912-1916

By G. DAVIS BUCKNER

Dr. Joseph Hoeing Kastle returned to his native and dearly loved state of Kentucky, July 1, 1911, to become Head of the newly created Department of Chemical Research in the Kentucky Agricultural Experiment Station. He was indeed wisely chosen for this position because of the complexity of his interesting character, lovable nature, excellent education and varied training. Joseph Hoeing Kastle excelled as a teacher, scientist, naturalist, philosopher, humanitarian and friend.

On September 20, 1912, Dr. Kastle became Director of the Kentucky Agricultural Experiment Station. This position he held at the time of his death, September 24, 1916.

Due to increased state and federal appropriations, the four-year period of his directorship was marked by great expansion in all departments. Particularly rapid were the growth of the agricultural extension program, the increase in physical equipment of the Experiment Station and the expansion of research in practically every field of agriculture.

The complex duties and responsibilities brought about by enlarged activities were borne fearlessly, conscientiously and effectively by this man whose physical make-up had been impaired from early childhood and whose nature was fundamentally that of a teacher and scientific investigator. His burden was made lighter because of the helpful cooperation of many of the Station staff.

The brilliant mind and magnetic personality of Dr. Kastle stimulated many lines of scientific research at the Experiment Station, the influence of which has continued and will continue thru the years. He infused his associates with eager desire to investigate the unknown; his personal energy and industry were examples for endless labor, and his standards of honesty, courage and kindness were of the highest order. He was an unusually gifted speaker and as such was greatly in demand.

That he attempted to live up to his standards and ideals was well shown when, shortly before his death, he said to a group of farmers, "In all our dealings with the farming public

we have sought to make friends for the institution we represent but above all we have sought to render service—the most scientific and efficient service—to the great people of our commonwealth”

When we that knew him have passed on, the name of Joseph Hoeing Kastle will lose its magnetic charm and will be spoken less frequently, but his work and influence will remain. Those who came in contact with this man were inspired, made to feel a glow of warmth and kindness and were lifted above the ordinary. No higher tribute can we pay to the memory of Joseph Hoeing Kastle than to say that he carries thru eternity the respect of the scientific world, the friendship of his associates, the love of his students and the gratitude of their parents.

AS THE FARMER VIEWS THE EXPERIMENT STATION

By PERRY B. GAINES

At first, I hesitated to accept the kind invitation to participate in this program because I realized my limitations as a public speaker and felt reluctant to assume the responsibility of making an address upon so important an occasion as this. After thinking it over I wondered if the sincerity of my utterances concerning this particular subject would not, in a measure, compensate for my lack of oratorical attainment and that, after all, some of you might not be more interested in hearing in plain language, simply spoken by an average farmer, how the average farmer views this experiment station than to hear a pleasing eulogy of it delivered by some gifted orator not in as close touch and sympathy with the masses who go to make up our farming group.

Having been born and reared in the country, having chosen farming as my life vocation and given, at all times, my personal attention to the details of management and operation of my lands I have been confronted with much the same conditions—much the same problems—as the average farmer and think it fair to assume that my personal views and my personal opinion of the Station should reflect with reasonable accuracy the views and opinions of tens of thousands of other Kentuckians now engaged in the pursuit of agriculture.

In giving expression to those views I shall undertake to be both frank and conservative, and restrain as far as possible any sentimental enthusiasm to which I might be inclined because of my high personal regard and warm personal affection for members of the University and the Station staffs. However, in the light of a most superficial knowledge of facts pertaining to the practical services rendered and fine influences wielded for the betterment of our agricultural, economic and social lives by the Experiment Station, it is hard for one to voice his appraisal of its true value and not appear a bit over-enthusiastic and extravagant in his language.

The development of the Experiment Station from its modest beginning a half century ago to its present high place in the sun has been one of constant, sure and substantial prog-

ress and it presents a splendid illustration of what may be accomplished by intelligent, well directed, persistent effort. Frankness compels me to admit, tho, that it has not always enjoyed the same high esteem and confidence of the public it holds now. Like every other progressive movement, it was compelled to win its way thru a maze of skepticism, disapproval and, in some instances, opposition. Those of you familiar with its earlier history will recall that at that time the farmers, as a class, looked upon both the Station and the College of Agriculture with doubt and misgivings as to their practical value.

Endowed as they were with a heritage of land possessing much of its virgin fertility and endowed also with a spirit of independence and self-reliance inherited from their pioneer ancestry, our Kentucky farmers could not easily bring themselves to believe that any college professor or college student could know more about farm management than they themselves knew—that the theoretical knowledge and teachings of those men could compare with the practical knowledge they had gained from their own experiences or from the experiences of their fathers, grandfathers or neighbors who had been successful, as success was generally rated—men who likewise scoffed at and doubted the practical worth of a lot of “book learning” applied to farming.

Even up to the time of the establishment of the Extension Service, some twenty years ago, when agricultural agents were offered to counties willing to cooperate by the subscription of nominal sums toward the payment of their salaries, there existed instances of almost open rebellion against the suggestion. The idea, they reasoned, of sending young upstarts like those to teach us how to run our business. Why, they don’t know whether corn should be planted in the dark of the moon or in the light of the moon. They don’t know whether the pigs, the calves and the colts should be castrated and weaned when the sign of the zodiac is in the head, in the heel or in the heart. They couldn’t tell by looking at a sick cow whether or not she had the “hollow horn”, the “hollow tail” or had “lost her cud.” That if they did know what was the matter with her they wouldn’t know how to doctor her. If she had the “hollow horn” they wouldn’t know how to bore holes

in horns to relieve her. If she had the "hollow tail" they wouldn't know how long a slit to make in her tail, where to make it or how much salt to put in it to cure that and if she had lost her cud they would not have the least idea how to make and give her another one of those important morsels. Why, one of those fellows even had the presumption to offer to tell Aunt Martha how to raise chickens, just as tho she hadn't been raising chickens for more than forty years and hadn't cured them of the cholera by putting red oak bark in their drinking water and hadn't cured them of the gapes by twisting the worms from their throats with bluegrass straws long, long before the young college sap was born. Now, while you will doubtless accept those things as having been spoken in a spirit of levity, I say to you in all seriousness that such outbursts of resentment and disgust were not so unusual as you may be inclined to believe.

Such an attitude toward the Station and especially toward its Extension Service was not confined wholly to the hard headed farmers either. Many other good citizens looked upon the project as a lot of theoretical tomfoolery gotten up to give "white collared professors" and "college boys" jobs—just another waste of the taxpayer's money, they argued.

But under capable teaching and intelligent direction on the part of the Station staff together with the sane diplomacy, ability, courage and energy shown by those young county agents, such prejudices were finally and forever dissipated and, today, the service rendered by the Experiment Station thru its various branches is generally considered to be one of the most valuable, one of the most indispensable, yet made directly available to all the citizens of Kentucky.

I say directly available to all the citizens advisedly, because that is literally true. There is hardly a business, vocation or profession which does not receive helpful cooperation and aid from some branch of the station's activities. The so-called agricultural agents are now looked upon as being much more than their title implies. Generally speaking, they are considered among the leading and best informed citizens of their respective counties and their counsel and advice is freely sought and given upon non-agricultural as well as agricultural matters.

But of course the paramount and most important function of the Station is, as it should be, directed to the advancement of agriculture and whether in the role of cooperating with and administering the AAA program or in giving lessons and demonstrations in domestic science to the housewives, its forces are always on the job and do that job cheerfully and well.

When it is considered that the prosperity of the farmer is essentially the yardstick with which any lasting prosperity of our country must be determined, when it is considered that in the ideals of the farm home lies the greatest strength—the greatest influence toward the building and maintenance of a more prosperous, contented and forceful citizenship—and that whatever is done toward the advancement of agriculture and the strengthening of the farmer's social and economic condition is immediately reflected in our state and national structures, the real and the potential value of an institution dedicated to the task of promoting and aiding such a cause can not be easily computed.

No vocation offers a better opportunity for man to live a broad, interesting and happy life than does the pursuit of agriculture, and since by the acquisition of knowledge and its intelligent application he is enabled to make his lands produce more bounteous crops, is enabled to breed and to feed better livestock, is enabled to provide for himself and his family the comforts and conveniences of a home where his children may be reared in its clean wholesome environment, too much consideration and too much effort can not be given to making that knowledge available to him and to inspiring him with the ambition to apply it in the art of uplifting and dignifying his occupation and of making his community and his state a better place in which to live.

That very thing is being done for him by his Experiment Station. That institution, thru its research and experimental work, has acquired and continues to acquire a wealth of sound and useful knowledge and thru its extension service, by radio, by publication and other means is disseminating that knowledge so thoroly and so effectively that there no longer remains an excuse for a Kentucky farmer to be ignorant of the basic prin-

ciples of advanced agriculture even tho he may have been denied the semblance of a common school education.

Yes, the value to the farmer of such an institution thru its extensive and diversified work is, indeed, hard to estimate. It goes so much farther than helping him to make greater commercial dividends upon his investment, it goes so much farther than teaching him the fundamental principles of his business, it imbues him with a greater respect and a greater love for his chosen vocation, it instils within him a keener appreciation of his good fortune in being in league and in partnership with nature and of his dealings with growing and living things the charm and fascination of which can not be equaled in any other occupation in the whole wide world.

SCIENCE AND AGRICULTURE

By F. B. MUMFORD

The celebration of fifty years of service to agriculture by an institution of such eminence as the Kentucky Agricultural Experiment Station is an event of national interest and one for congratulation on the part of similar institutions located in forty-eight States of the United States and the outlying territories and dependencies.

The Kentucky Agricultural Experiment Station was organized before the passage of the Hatch Act by the Federal Congress in 1887, thus placing it among that enterprising group of States which early recognized the importance of science as related to the agricultural industry. The passage of the Morrill Act in 1862, providing for colleges of agriculture and mechanic arts, had resulted in the establishment of a large number of institutions attempting to teach the subject of agriculture to students in a regular college curriculum. We can not say that these colleges were successful in their early efforts. They were not satisfactory to the farmers for whom they were organized and were held in low esteem by the faculties of the older institutions.

We are able now to determine the reasons for these early failures. The teaching of agriculture before 1885 or 1890 was either in the nature of empirical knowledge based on actual farm experience or the teaching of principles, chiefly chemical, by scientists who had no adequate knowledge of agriculture.

There was yet to be developed a body of knowledge by the agricultural experiment stations which was to constitute the basis for all agricultural teaching including not only college teaching but agricultural extension teaching as well. At the present time improved agricultural practices are based on the sound foundation of scientific research. I think the agricultural experiment station is unique among scientific institutions in that it has not only discovered principles underlying the agricultural industry but it has very definitely developed a technique for the application of the discoveries of science to the varied requirements of the farm enterprise. The progressive development of the colleges of agriculture, both in resident

teaching and in agricultural extension, has been made possible by research in agricultural experiment stations. From the passage of the Hatch Act in 1887 to the present the history of these institutions has been a history of continual progress, of increasing importance to agriculture, and a more or less reluctant acceptance on the part of established institutions for higher education.

It is evident, from the provisions of the Federal and State legislation providing for the establishment and further development of agricultural experiment stations, that the central idea in all was service to agriculture and to rural people. These institutions were not established primarily in the interests of science *per se*, but were established in order that the methods of science and of scientific research might be applied to the solution of the problems of agriculture. How well these institutions have accomplished their purposes is a matter of general knowledge. Thru their work there has been brought to the service of agriculture the highest scientific ability utilizing the most modern equipment necessary for research, and thus providing for the industry of agriculture the same aids to production that have been available to other industries thru industrial research.

Now, after fifty years of active and significant service to mankind, we are profiting from the results of the work of agricultural experiment stations in improved quality of farm products, reduced costs of production, improved varieties of plants and breeds and races of animals, in the prevention and control of animal and plant diseases, and have in the state agricultural experiment stations of the United States an organization of individuals of the highest scientific training available, equipped with apparatus, materials and supplies which combined constitute one of the most important agencies for scientific research in the world. We may regard these organizations and institutions as representing one of the most effective instruments for the solution of peace-time problems. With the help of these institutions agriculture is prepared to meet the difficult problems of the future.

It is not any part of the purpose of this brief discussion to recount the definite achievements of agricultural experiment

stations. The value of the results of scientific research in these institutions is generally recognized. The experiment stations have been remarkably successful in meeting the problems of agricultural production as they have developed, and are in a position to continue to solve such problems in so far as science and research can accomplish such solutions.

It may not be inappropriate on this occasion to give some brief consideration to the future of the agricultural experiment station. What is to be the future of American agriculture? Are we traveling in the right direction? Is this industry of agriculture—the oldest, most permanent, and enduring of all industries—to be replaced in whole or in part by a factory system? Is it conceivable that future food and fibers, for feeding and clothing mankind, will be supplied by synthetic products made in factories?

In the August issue of Harper's Magazine, Parrish and Clark, writing under the title, "Chemistry Wrecks the Farm", have developed the thesis that the cultivation of the soil and the production of food, feed, and fiber on farms will become a thing of the past, as other industries have passed out of the picture due to the application of the results of scientific research. I quote from this article: "The farm as an individual production unit * * * is seeing its last days. For chemistry and technology are bringing agriculture under control." Again, "It would be relatively easy to produce the 1930 crops with only five per cent of the (farm) population." In a prophetic vein the development of agriculture and its probable decline, the third stage is described as follows: "Control stage, which eliminates the soil as being unnecessary to plant growth. Plants are grown in a solution of necessary organic substances in trays or cabinets with a new crop every few weeks. This stage takes agriculture off the farm into factories or kitchens and places it under strict man-made control."

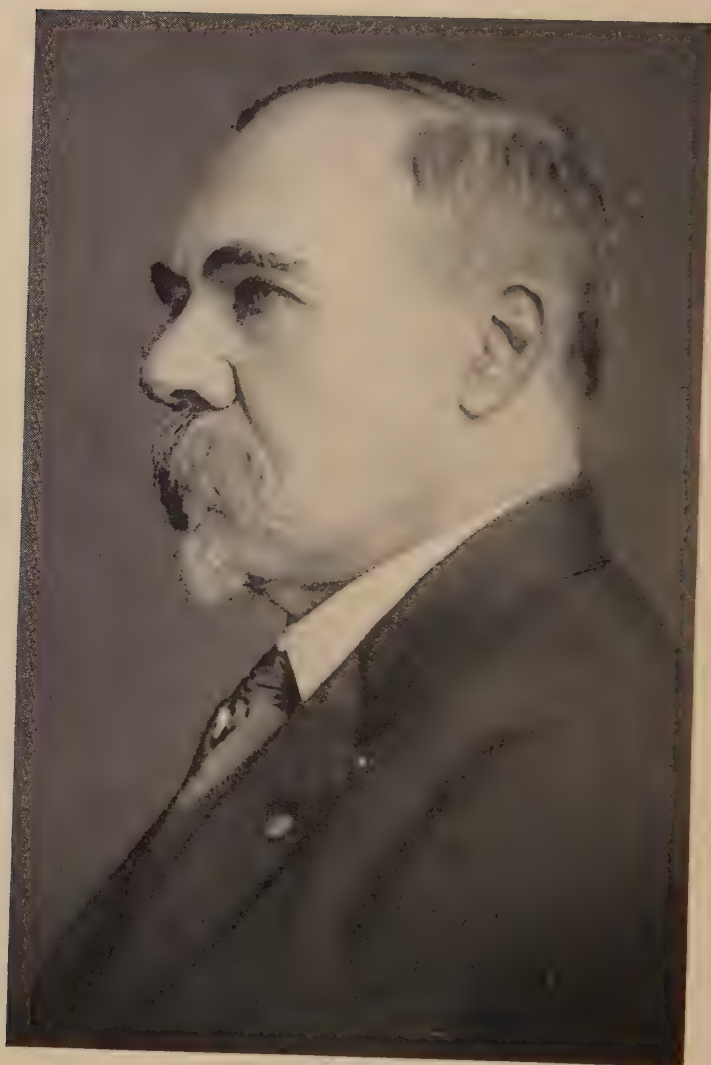
I have quoted sufficiently from the article to indicate the tenor and conclusions of the authors. There are so many assumptions in this article which can not be verified or confirmed by results of actual investigations that any extended discussion at this time probably would be of little interest. However, great as have been the achievements of chemistry, there is no

adequate basis for the assumption that five percent of the present farm population could satisfy the demands for food and fiber crops of our present population, to say nothing of the probable population increases.

It also is pertinent to inquire as to the source of the materials which are to be synthesized in the production of food, feed, and fiber. There must be raw materials from which such products could be made and these must be taken from the air or the soil, which means that even if the remarkable development described in this article were remotely possible, there still would be required a great volume of raw products, which must come from the soil. At no previous period in the world's history have the cultivators of the soil had so complete control over factors of production. Scientific research is now and will continue to be the most effective instrument for stabilizing agriculture, and is not now and will not become a weapon for its destruction.

We must continually recall to our minds the permanency of agriculture. The cultivation of the soil is the oldest human occupation. It represents the beginnings of civilization and continues to represent the most stable and permanent element in our civilization. History records the decline and ultimate destruction of many of the greatest cities built by man; governments have flourished and have perished, but the cultivation of the soil and the maintenance of the farm home continue as the most permanent and secure single economic and social factors in our civilization. Some time ago the French government offered a prize to the family having continued to live longest on one farm. The prize was awarded to a family whose ancestors had lived on and owned the same farm for a thousand years. During this period the country had been invaded a score of times, kingdoms had changed to republics and republics to dictatorships and back again to republics; but this family, on its own farm, with its own agricultural enterprise, had continued secure in its possession of land and the facilities for production.

Agriculture and farming continue to offer the most secure, the most permanent, and in many ways the most satisfying type of living, not only in this country but thruout the world.



ALFRED MEREDITH PETER, Sc. D.
Acting Director of the Kentucky Agricultural Experiment Station,
1916-1917.

Farming is not only a business motivated by economic returns, but it is a way of living. The farm and the farm family represent a stable and permanent social unit in our civilization on which can be builded a permanent governmental structure. The nation can not afford to ignore certain values peculiar to rural life. Without these values a nation is in very real danger.

It is the primary function of the agricultural experiment station to maintain these permanent values and to make the business of farming a safer and more remunerative and a more satisfying occupation. One by one the risks and vicissitudes surrounding the farmer and his work are being removed by scientific research in the agricultural experiment stations. Destructive animal diseases are largely under control thru the work of these institutions; insect and fungus diseases of plants can be controlled, and in many cases entirely prevented. The adaptation of crops to special soils, the improvement of plants thru the efforts of plant breeders, and the improvement of the quality of all farm products are outstanding achievements of the agricultural experiment stations.

A Planned Agriculture. If agriculture as an industry is to become stabilized and farmers as a class are to be assured even a minimum standard of living, some further effort must be made in the direction of national planning. There is nothing essentially new or startling about the idea of national planning. It does, however, involve the idea of a greater emphasis on governmental relation to the factors of production and the utilization and distribution of agricultural products. The policies of the federal and state governments have from the very beginning exercised a compelling influence upon agricultural development. They will continue to do so. For more than fifty years the most important single governmental policy affecting the agricultural industry was the practically free gift of land under the homestead act. As a result of this policy farmers were influenced to settle upon and develop not only land of agricultural value but millions of acres of marginal and submarginal land entirely incapable of providing even a minimum standard of living worthy of our American tradition.

If the federal government had based this far-reaching land policy upon a well-planned classification of soils, we would not now be facing the necessity of resettling stranded populations and instituting a policy of buying back land from misguided settlers. We have too long proceeded on the theory that all land was agricultural land and should be occupied and developed. We must now retrace our steps and inaugurate a policy which is entirely different from, if not opposed to, this conception. Land of limited agricultural value may be very desirable for forestry, for recreation, for wild-life reservations, or in some cases for use in the control of floods and watershed erosion. We do not yet have an adequate scientific basis for a classification of soils of sufficient refinement to meet fully the ultimate requirements and serve as an accurate guide in developing a permanent policy of resettlement. This is a problem for the agricultural experiment station and can be solved.

There is apparent in some quarters a disposition to hold science and research responsible for our current economic distress. It has been suggested that "science take a holiday". We are accused of knowing too much. It is said that science and discovery have so accelerated our progress over the control of our physical environment that we are now able to produce more of everything than can possibly be utilized by the present population of the earth. The argument seems to be that because science has had so outstanding a success in the fields of its chief endeavors it is now criticized because it has not solved all the complex problems of human relations.

In the past we have left to the preacher and the politician the development of those social controls which influence human relations and are of the utmost importance in human living. Has the time come when the scientific method can be applied to the solution of social problems? Are right living and a good life subjects for scientific research? Is the development of righteousness a function of scientific research?

It is, I think, clear to all thinking men and women that as a result of the applications of scientific research, control of our environment is far more complete than our control over human relations. I think we must recognize that there are "things of

the spirit" which are not now and may never be amenable to scientific research as we now understand the term. All scientific research must have for its ultimate goal the welfare of the human race. It is possible, as someone has suggested, that we may do something more in the direction of humanizing science, and this suggests more and more attention to social and economic problems. This still will leave us with the problem of human character. The measure of the value of scientific research will be determined by the use of its results by human beings. It must be recognized that the results of science may be used by vicious individuals for purposes inimical to human welfare, but this is not to be used as an argument against further scientific research but rather to emphasize the fundamental importance of the development of moral controls.

Is the agricultural experiment station responsible for the conditions which have brought about the present agricultural depression? The argument sometimes is advanced that thru the efficient work of the agricultural experiment stations the efficiency of farmers has been so greatly increased that a smaller number of farmers is now able to produce a greater total product. By reason of this they have been encouraged to overproduce and thus accumulate a surplus of food and fiber crops. This surplus has decreased the price of farm commodities and the result is a lower farm income. Any thinking person can readily discover that there is little basis for this conclusion. In the first place, the American farmer's surplus, if it exists, is due to the almost complete closing of foreign markets to American Agricultural products. This alone would be sufficient to explain the surplus, but the farmer's feverish effort to produce has resulted from a deeper cause. After the inflation period, followed by a sharp deflation, the farmers of America found themselves deeply in debt. The diminishing prices of farm products, descending to a record low in 1932, made it necessary for the farmer to produce the largest possible number of farm units to meet his interest charges, taxes, and other requirements. The invention of labor-saving farm machinery made it possible for fewer farmers to produce more products and this the farmer was forced to attempt, not because of any work of the agricultural experiment stations but because of the closing of world markets, the sudden



GEORGE ROBERTS, M. S.

Acting Dean of the College of Agriculture, 1916-1917; Assistant Dean,
1919—

change in the monetary standard, and the resulting widespread indebtedness.

The agricultural experiment station pleads guilty to having aided the farmer in increasing his efficiency; by increasing his efficiency it aided him to decrease the cost of production of all farm commodities. The experiment station has made it possible for the farmer to secure a larger farm income on a smaller acreage and with less labor.

The difficulties of the farmer under present conditions seem to be largely economic and governmental, and while agricultural experiment stations may contribute to a knowledge of the workings of economic law and the influence of governmental policies, it is not the province of the experiment stations to undertake to interfere with national and international economic policies and governmental activities. These are problems which can be solved only by the farmer himself, organized to protect his own interests and faithful to the traditions of the agricultural industry.

The farmer's problems capable of solution by scientific research are not all solved. More and more difficult problems of greater complexity continue to arise. The possibilities of further contributions to agriculture by the experiment stations are incalculable. The possibilities in this direction are infinite.

And now, in conclusion, if we may dare to extend our vision to the illimitable reaches of time and space and in wonder and imagination construct for our minds the possibilities of achievement thru research, we may conclude with Sir James Jeans that our achievements of the past are to the possibilities of accomplishments in the future as is the thickness of a postage stamp to the height of Mount Blanc. I close by quoting from the same author:

"As inhabitants of the earth we are living at the very beginning of time. We have come into being at the fresh glory of the dawn and a day of almost unthinkable length stretches before us with unimaginable opportunities for accomplishment. Our descendants in far-off ages, looking down this long vista of time from the other end, will see our present age as the misty morning of the world's history. . . . By what light we have, we seem to discern that the main message . . . is one of

hope to the race and of responsibility to the individual—of responsibility because we are drawing plans and laying foundations for a longer future than we can well imagine.”

After Dr. Mumford's address, President McVey introduced Professor E. S. Good, Head of the Animal Industry Group, who, as introductory to unveiling and presenting a portrait of Dean Thomas P. Cooper to the University, said:—

We are often told by eminent thinkers and speakers, that we are living in a wonderful age of scientific research and discovery. However, it takes a program like the one this afternoon, a resume of the development of agriculture in the last fifty years, to make us appreciate how great a contribution scientific agriculture has made to this forward movement of research and discovery.

We have seen, this afternoon, the foundation work of Dr. Scovell, which was carried on at a time when scientific agriculture was in its pioneer stage. We have seen the emphasis placed upon research, which Dr. Kastle was particularly fitted by training and temperament to foster. As changing conditions demanded a man not only cognizant of the great value of research but one with special training in the economics of agriculture, in farm organization and management and extension, the College of Agriculture and Experiment Station of the University of Kentucky were most fortunate to secure Thomas Poe Cooper as Dean and Director. Upon the recommendation of President McVey he was appointed to his present position in 1917 and in January, 1918, Dean and Mrs. Cooper came to Kentucky.

As far as I know, Dean Cooper has never engaged in any other occupation than one relating to Agriculture. As a young man he managed farms. After graduating from the College of Agriculture of the University of Minnesota, he was placed in charge of a research project in cost accounting in the Division of Agronomy and Farm Management of that institution, and the results were published. Gaining insight into the value of specific farm organization from this work, he was placed in charge of a group of demonstration farms. This marked the beginning of extension work in Minnesota. Because of the capable way in which he handled this work, attracting the attention not only of the farmers of Minnesota but of neighboring

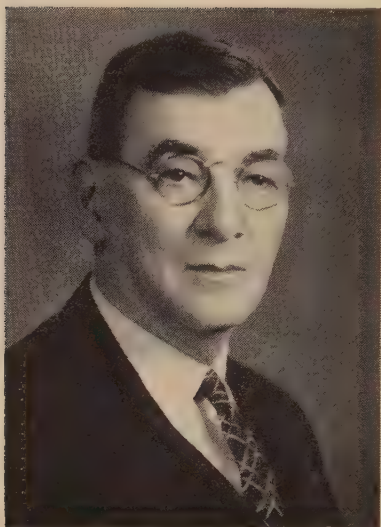
states as well, he was appointed head of The Better Farming Association of North Dakota. After two years in this position, he became the Director of the Experiment Station and Extension work in the North Dakota Agricultural College.

During his regime in North Dakota he changed the system of farming in that state from one of almost exclusive small-grain farming to a diversified one, emphasizing a larger acreage of alfalfa, soil and pasture improvement, increased livestock production and enlarged experimentation.

Dr. Andrew Boss, now Vice-Director of the Agricultural Experiment Station of the University of Minnesota, one of the most beloved and respected men of his profession, a former teacher of Thomas Poe Cooper, says of his pupil's ability and work during these years. "Director Cooper's keen business insight, his habits of thrift and industry, and his ability to keep in touch with the many lines of work and many different people, enabled him to initiate new trends in agriculture in Minnesota, and to re-direct in a large measure the farming operations in North Dakota. Dean Cooper merits great credit for initiating and developing many of the good farm management practices now in effect in these states."

Since coming to the University of Kentucky in 1918 Dean Cooper has needed all his training and experience as an executive and economist, for he has guided the Agricultural College and Experiment Station thru the post-war period of adjustment; the succeeding period of overexpansion, and the last few years of depression, with a caution and wisdom that has kept us on an even keel in spite of the storms. Because of his national reputation as an agricultural economist, he was offered the position of Chief of the Bureau of Agricultural Economics, U. S. Department of Agriculture, which position he declined to accept permanently. However, the Board of Trustees, appreciating the honor of such an appointment, granted him a years leave of absence in 1926-27 that he might assist the Secretary of Agriculture during a transitory period of reorganization in that bureau.

Because of this same reputation he served as chairman of a special committee of The Association of Land Grant Colleges and



ADAM PEPIOT, PHOTO

HENRY ERNEST CURTIS, M. S.
Chemist, 1887.

Universities to prepare and submit reports in 1927 and again in 1932, on The Agricultural Situation in the United States. He has served as Secretary-Treasurer of this Association since 1930. Dean Cooper is a past president of The American Farm Economics Association and of The Association of Southern Agricultural Workers. Time does not permit my going into further detail as to organizations to which Dean Cooper belongs, and honors and responsibilities which have been and are his. However, we must mention that here in Kentucky, in addition to his

regular duties, he is Vice-Chairman of the Kentucky Board of Agriculture, Vice-Chairman of the Kentucky Livestock Sanitary Board, a member of the Kentucky State Parks Commission, a director in the Federal Land Bank of Louisville and its affiliated organizations, and a director of the Central Bank for Cooperatives.

Since Dean Cooper came to the University of Kentucky in 1918 the physical plant of the Experiment Station has been enlarged to a considerable extent. Three hundred and fifty-seven acres of land, much needed for expanding experimental investigations, have been added to the Experiment Station farm. New Buildings, including a Livestock Pavilion, a Dairy Manufactures Building, a Farm Engineering Building, and several new barns have been added. These were very much needed for effective teaching and experimental work.

Of great importance in developing the agricultural possibilities of Kentucky, and studying types of agriculture for different localities, was the establishment of two agricultural Substations. One at Quicksand, in eastern Kentucky, comprising some 15,000

acres, was the generous gift of the late E. O. Robinson. The other, comprising 600 acres, is located at Princeton, Caldwell County, in western Kentucky.

Co-workers in an institution such as ours, show their appreciation of the man who guides and directs their activities by co-operation, in pride of accomplishment, and in an attitude of good-will. Such we feel is the spirit of our institution and a thing apart from its physical development. Such a spirit is the influence of Dean Cooper upon his co-workers, and it is because of this spirit that we have united in a desire to express our appreciation of Dean Cooper's fine leadership and accomplishments, thru the presentation of his portrait to the University of Kentucky.

Fortunate indeed are we that for eighteen years we have had the guidance of a man of such personal integrity, such unwavering devotion to work, and unswerving loyalty to co-workers; a man of foresight, courage and decision, and an executive commanding respect and confidence. If the artist has been able to transfer these qualities to the canvas he is a great artist indeed. Sudduth Goff, formerly of Lexington, now of Chicago, a portrait painter of international reputation, has made this portrait of Dean Cooper.



HARRISON GARMÁN, Sc. D.
Entomologist and Botanist, 1889—

Professor Good called upon Miss Catherine Corter Cooper who came to the platform and unveiled the portrait.

After the unveiling, Professor Good presented the portrait to President McVey for the University of Kentucky in the following words: "I have the honor, on behalf of the staff of the College of Agriculture, to present this portrait of Dean Cooper to the University of Kentucky."

President McVey accepted the portrait for the University.

President McVey then stated that when, in 1885, the Kentucky Agricultural Experiment Station was established, in addition to the Director there were six members of the staff. Of this number three had been in continuous service for the intervening years and were in the audience. He then asked A. M. Peter, H. E. Curtis and H. Garman to come to the platform and on behalf of the staff presented each with a handsome cane as a token of love and esteem and for their long and distinguished service to the institution.

Reverend T. E. Ecton pronounced the benediction.

Letters of felicitation, friendship and good will on the occasion of the Fiftieth Anniversary of the founding of the Experiment Station, were received from sister institutions, co-workers and friends, as follows:

State of Alabama, Department of Agriculture. Geo. H. Marsh, Supervisor, Division of Agricultural Chemistry.

Alabama Polytechnic Institute. J. C. Grimes, Head Animal Industry Group.

Alabama Polytechnic Institute. L. N. Duncan, President.

Colorado State College. The governing board and the faculty, by Chas. A. Lory.

The Connecticut Agricultural Experiment Station. William L. Slate, Director.

Centre College. Charles J. Turck, President.

University of California, College of Agriculture. C. B. Hutchison, Dean.

The Agricultural Experiment Station, Colorado State College. E. P. Sandsten, Dean and Director.

Cornell University, Ithaca, N. Y. A. R. Mann, Office of the Provost.

University of Delaware, Agricultural Experiment Station. C. A. McCue, Dean and Director.

Eastern Kentucky State Teachers College. H. G. Donovan, President.

Agricultural Experiment Stations of the University of Florida. Wilmon Newell, Director.

Ohio Mechanics Institute. John T. Faig, President of Departments.

The Highland Institution. Mabel C. Hall, Dean.

Hindman Settlement School. May Stone, Secretary-Treasurer.

Illinois Agricultural Experiment Station. H. W. Mumford, Director.

University of Illinois, College of Agriculture. E. J. Keilholz, Extension Editor.

- University of Idaho, College of Agriculture. E. J. Iddings, Dean and Director.
- Iowa Agricultural Experiment Station. W. H. Stevenson, Vice Director.
- New Jersey Agricultural Experiment Station. Jacob G. Lipman, Director.
- Murray State Teachers College. J. W. Carr, Dean.
- Mississippi State College. W. F. Hand, Dept. of Chemistry.
- Morehead State Teachers College. J. Howard Payne, President.
- University of Minnesota. Department of Agriculture, University Farm. W. C. Coffey, Dean and Director.
- State of Maryland, Inspection and Regulatory Service. L. E. Bopst, Associate State Chemist.
- Michigan State College of Agriculture and Applied Science. V. R. Gardner, Director of Experiment Station.
- University of Missouri. F. B. Mumford, Dean and Director.
- Montana State College Agricultural Experiment Station. F. B. Linfield, Director.
- University of Maryland, Agricultural Experiment Station. H. J. Patterson, Director and Dean.
- North Dakota Agricultural Experiment Station. H. L. Walster, Dean and Director.
- University of Nevada, Agricultural Experiment Station. S. B. Doten, Director.
- North Carolina Agricultural Experiment Station. R. Y. Winters, Director.
- Oklahoma Agricultural and Mechanical College. C. P. Blackwell, Dean and Director.
- The Pennsylvania State College, School of Agriculture and Experiment Station. S. W. Fletcher, Director of Research.
- Purdue University, Agricultural Experiment Station. J. H. Skinner, Director.
- Commonwealth of Kentucky, Department of Education. James H. Richmond, Superintendent of Public Instruction.
- Kentucky Department of Education, Emergency Education. Waylon Rayburn, District Supervisor, Emergency Education.
- South Dakota State College of Agriculture and Mechanic Arts. James W. Wilson, Director, Experiment Station.
- South Carolina Experiment Station. R. A. McGinty, Acting Dean and Director.
- Agricultural and Mechanical College of Texas. G. S. Fraps, Chief, Division of Chemistry, State Chemist.
- Texas Agricultural Experiment Station. F. D. Fuller, Chief, Division of Feed Control.
- State of Tennessee, Department of Agriculture. V. L. Fuqua, State Chemist and Superintendent.
- State of Tennessee, Cooperative Extension Work, Agriculture and Home Economics, R. H. Milton, Asst. Agronomist.
- University of Tennessee, Agricultural Experiment Station. C. A. Mooers, Director.
- Texas Agricultural Experiment Station. A. B. Conner, Director.

- United States Department of Agriculture, Bureau of Dairy Industry.
O. E. Reed, Chief of Bureau.
- United States Department of Agriculture, Food and Drug Administration. W. G. Campbell.
- United States Department of Agriculture, Office of Experiment Stations. James T. Jardine, Chief.
- United States Department of Agriculture. Milo Perkins, Assistant to the Secretary.
- United States Department of Agriculture, Agricultural Adjustment Administration. D. S. Myer, Asst. Director, Program Planning Division.
- University of Louisville. R. A. Kent, President.
- The University of Vermont and State Agricultural College. T. H. Hills, Dean and Director.
- Utah State Agricultural College, Agricultural Experiment Station.
David A. Burgoyne, Secretary to Director P. V. Cardon.
- Western Kentucky State Teachers College. H. H. Cherry, President.
- The University of Wyoming, College of Agriculture and Experiment Station. J. A. Hill, Dean and Director.
- University of Wisconsin, College of Agriculture. Andrew W. Hopkins, Editor.
- The State College of Washington, College of Agriculture and Experiment Station. Edw. C. Johnson, Dean and Director.
- C. S. Brent Seed Co., Lexington, Ky. A. C. Brent.
- C. V. Whitney Farm, Lexington, Ky. Louie A. Beard.
- Browder Milling Co., Fulton, Ky. Joe Browder, L. J. Clements.
- Louisville Bank for Cooperatives. John E. Brown, President.
- Philip L. Blumenthal, Buffalo, N. Y.
- George D. Beardsley, Beardsley & Beardsley, Kansas City, Mo.
- The Phoenix Hotel Company, Lexington, Ky. John G. Cramer, Manager.
- Hon. A. B. Chandler, Governor of Kentucky.
- Liggett & Myers Tobacco Company, Lexington, Ky. H. E. Coleman.
- Country Gentleman. The Curtis Publishing Company. Sara Bulette, Women's Club Editor.
- Commonwealth of Kentucky, Department of Health. Sarah V. Dugan, Director, Bureau of Foods, Drugs and Hotels.
- Frankel and Curtis, Architects and Engineers, Lexington, Ky. L. K. Frankel and J. J. Curtis.
- Kentucky State Fair. Garth K. Ferguson, Secretary.
- Graves, Cox and Company, Lexington, Ky. George K. Graves.
- Gordon, Laurent, Ogden & Galpin, Louisville, Ky. Robert G. Gordon.
- A. M. Harris, County Agent, Ballard and Carlisle Counties.
- Ethel Hopphan, 3304 Jefferson Ave., Cincinnati, Ohio.
- Carrie Lee Hathaway, 481 East Main Street, Lexington, Ky.
- John R. Humphrey & Company, Lexington, Ky. John R. Humphrey.
- Louise B. Healy, Lexington, Ky.
- The Hurst Home Insurance Company, Lexington, Ky. O. E. Hurst.
- The Hillenmeyer Nurseries, Lexington, Ky. Louis E. Hillenmeyer.

- The Acme Veneer & Lumber Co., Cincinnati, Ohio. Harry Hartke.
American Potash Institute, Inc., Washington, D. C. J. N. Harper.
Munds, Winslow & Potter, 40 Wall St., New York. Howard P. Ingles.
Farm Credit Administration, Los Angeles, Calif. J. W. Jones.
O. B. Jesness, Chief of Division of Agricultural Economics, University of Minnesota.
E. C. Johnson, Associate Professor, University of Minnesota.
Keen Johnson, Richmond, Ky.
Frank Jones, Whitney Farm, Lexington, Ky.
H. R. Kraybill, State Chemist and Seed Commissioner, Purdue University, Agricultural Experiment Station.
Kasco Mills, Toledo, Ohio. O. E. M. Keller, President.
Eastern Dark Fired Tobacco Growers Association. Thos. E. Johnson, General Manager.
Lexington Roller Mills Company. Jos. LeCompte, President.
Lions Club, Lexington, Ky. D. H. Lloyd, President.
City of Lexington. Charles R. Thompson, Mayor.
City of Lexington. C. E. Fithian, City Manager.
Carrier Corporation, Newark, N. J. J. I. Lyle.
Lexington Board of Commerce. W. Emmet Milward, President.
Mrs. Guy Lockwood, Paducah, Ky. President, McCracken County Homemakers' Assn.
Thomas H. Morgan, Woods Hole, Mass.
W. W. H. Mustaine, The University of the State of New York.
Security Trust Company, Lexington, Ky. C. N. Manning, President.
James E. Mastin, 1064 Nelson Ave., New York, N. Y.
Koreandale Farms, Morganfield, Ky. Chas. M. Meacham, Jr.
Wooten Community Center, Wooten, Ky. Mary Rose McCord.
A. E. Menke, The Riverside, Reno, Nevada.
Kentucky Orchards Company, Valley Station, Ky. R. E. Nute.
Mrs. Alice Shelby Riddell (Mrs. Hugh Riddell), Irvine, Ky.
Purina Mills, St. Louis, Mo. F. E. Boling, Manager.
Mark J. Smith & Sons, Burnett, N. Y. Mark J. Smith.
Walter Schepelman, Baking Technologist, Standard Brands Ltd., Toronto, Canada.
A. O. Stanley, Attorney at Law, Washington, D. C.
Farm Credit Administration of Louisville. Jewell Staggs, Secretary to E. Rice.
Stoll, Muir, Townsend & Park, Lexington, Ky. Richard C. Stoll.
Mrs. Snowden Smith, Crestwood, Ky.
The Louisville Times, Tom Wallace, Editor.
Anne M. White (Mrs. J. S. White), Campbellsville, Ky.
L. L. Walker, Lancaster, Ky.
Mrs. Robert Warren, Anchorage, Ky.
Allen Zaring, Richmond, Ky.

